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# SUSQUEHANNA RIVER BASIN COMMISSION



## GUIDELINES STREAM CLEARANCE AND RESTORATION

OCTOBER, 1973

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## PREFACE

The occurrence of hurricanes, storms and floods often results in the deposit of debris and wreckage which create flood hazards. A recent example was Tropical Storm Agnes in June of 1972. Extensive emergency clearance activities were required to remove the debris and wreckage. Some of these corrective efforts were found to include unnecessary channelization and other physical alteration of natural stream features that resulted in unfavorable impacts.

Following meetings with Federal, State and private agencies, the Susquehanna River Basin Commission decided there was a definite need to develop guidelines for the conduct of emergency and nonemergency stream clearance work. The purpose of these guidelines is two-fold: 1) to help coordinate and formulate a uniform policy for stream clearance in the Susquehanna River Basin, and 2) to prevent environmental degradation during clearance work and insure pre-flood environmental quality.

In preparing these guidelines the Commission has drawn heavily from written recommendations provided by the Baltimore District, Corps of Army Engineers, the Pennsylvania Fish Commission and the Soil Conservation Service, New York State. The guidelines were subjected to full review by the signatory parties as well as public discussion by the Commission before being finalized. Comments received from the Department of Environmental Conservation, New York; Department of Environmental Resources and Fish and Game Commissions, Pennsylvania; and Department of Natural Resources, Maryland were considered and included as appropriate.

The guidelines were formally adopted by the Commission on October 12, 1973. The Commission recommends that these guidelines be adopted by those agencies of the signatory parties which have responsibility for regulating stream clearance activities.

Additional copies of these Guidelines may be obtained by writing to the Susquehanna River Basin Commission, 5012 Lenker Street, Mechanicsburg, Pennsylvania 17055.





# SUSQUEHANNA RIVER BASIN COMMISSION

## GUIDELINES

### STREAM CLEARANCE AND RESTORATION

OCTOBER 12, 1973

#### BACKGROUND

The deposition of debris and wreckage in streams following hurricanes, storms and floods often creates flood hazards that require correction.

It has been observed that frequently the corrective efforts include unnecessary and unauthorized channelization, straightening of meanders and physical alteration of natural stream bed features, destruction of vegetation along stream banks and deposition of debris within areas subject to future flooding. The results can be loss of aesthetic qualities, destruction of fish and wildlife habitat, reduced recreation usefulness, and increased potential for erosion and sedimentation.

Stream clearance and restoration may, in a major disaster, be conducted with Federal assistance under the Office of Emergency Preparedness Disaster Assistance Program. Collateral support and direction of corrective action may come from State or local government or through the efforts of other public or private interests.

A common denominator among the various programs is that requests for stream clearance work usually originate with local government or the individual property owner. Proposals for projects can be roughly classed into two groups.

- (1) Those in which there is an imminent flood threat to life and property.
- (2) Those in which a future flood hazard condition has been created.

The response to the first condition obviously requires immediate action by available means or methods to alleviate the problem. The second, which makes up the great bulk of debris and wreckage removal projects, usually is not identified until after the emergency has passed and can be addressed in a time frame based on the severity of the actual hazard presented.

Responsible Federal agencies along with State game, fish and environmental agencies have recognized a need to prevent unfavorable environmental impacts as a result of these stream restoration and clearance operations. Normally such work is covered by a State administered permit system; however, there remains a need for the development of general guidelines regarding stream clearance and restoration work.

## PURPOSE AND SCOPE

The purpose of the Commission's proposed guidelines is twofold: 1) to help co-ordinate and formulate a uniform policy for stream clearance and restoration throughout the basin in both emergency and non-emergency situations, and 2) to prevent environmental degradation during stream clearance and restoration operations and insure preflood environmental quality upon completion of the work.

The scope of the guidelines covers stream clearance and restoration work necessary to correct flood hazard conditions created by flood flows or deposition of debris from other causes and includes: definition of terms, listing of objectives, general and specific work guidelines and recommendations for co-ordination and regulation of stream clearance and restoration projects and programs. In addition to the guidelines contained herein, all applicable Federal, State and local laws and regulations apply. Specific on-site requirements may be added by appropriate Federal or State agency representatives.

Stream clearance and restoration is defined as the removal of debris and wreckage and restoration of the stream channel to its preflood discharge capability and conditions, and as necessary, stabilization of the stream banks through the affected areas.

Debris and wreckage are defined as any materials which have been deposited or caused to be accumulated in a stream by the effects of high water and which impede the flow of water creating a potential flood hazard, or that encourage bank erosion and alteration of the regular stream channel.

## OBJECTIVES

The objectives in establishing the proposed guidelines are to:

- (1) Insure work is accomplished on those stream reaches where accumulations of debris and wreckage and/or bank erosion has caused a change of channel that poses a potential flood hazard to life and developed property.
- (2) Insure clearance and restoration work does not unnecessarily alter the natural meander and course of the stream, or the general contour of the stream bed and vegetative cover of its banks.
- (3) Protect fish and wildlife habitat as well as natural aesthetic qualities of the stream.
- (4) Establish standards for doing work that will coincide with applicable Federal, State and local laws and regulations concerning environmental pollution control and prevention.
- (5) Establish co-ordination of Federal, State and local government and private interests relative to stream clearance and restoration projects.

GENERAL GUIDELINES FOR CONDUCT OF  
STREAM CLEARANCE AND RESTORATION WORK

- (1) The landowner or the contractor must obtain the necessary permit for the clearance work and indicate an understanding of applicable regulations and of these guidelines before work is started.
- (2) When and where possible all heavy equipment should be kept out of the stream during the conduct of the work.
- (3) Materials such as logs, stumps and other large and heavy pieces of debris should be winched or lifted out of the stream when possible.
- (4) Generally only debris restricting the flow of the stream should be removed; however, the field representative of the permit issuing agency should exercise individual discretion relative to removal of additional material.
- (5) Channelization should be avoided.

- (6) Spoil piles should be established away from the stream above high water elevation. All possible precautions should be taken to minimize damage to timber trees, shrubs and ground cover along the stream bank in the work area and in developing access ways.
- (7) Access ways and storage areas should be restored by the contractor upon completion of the job. Immediate stream bank areas in the work area should be reseeded or replanted promptly.
- (8) Burning of any debris removed from the stream should only be done with the proper permits.
- (9) Stream gradients shall not be made uniform nor shall "sheeting" conditions be created during restoration work.
- (10) Restoration in areas where flood hazard potential is minimal should receive low priority for action.



## DISCUSSION AND APPLICATION OF GUIDELINES

### I. PROTECTION OF LAND RESOURCES

It is intended the land and water resources outside the limits of the permanent work performed be preserved in their present condition or be restored to a condition after completion of clearance and restoration that will appear to be natural and not detract from the appearance of the natural stream. The work shall be confined to the area defined in the permit.

#### A. PREVENTION OF LANDSCAPE DEFACEMENT

Except in areas designated to be cleared the contractor shall take care not to cause undue damage to or remove trees and/or shrubs without special authority from the agency issuing the permit, their authorized representative, or the landowner.

#### B. RESTORATION OF DAMAGED LANDSCAPE

Any tree or other landscape feature scarred or damaged by the contractor's equipment or operations shall be restored as nearly as possible to its original condition at the contractor's expense. A representative of the agency issuing the permit or assigned inspection work will decide what method of restoration shall be used, and whether damaged trees shall be treated or removed and disposed of under requirements for clearing and grubbing. All scars made on valuable timber trees and shrubs not designated on the plans to be removed, or by the removal of limbs, shall be coated as soon as possible with an approved tree wound dressing. All trimming or pruning shall be performed in an approved manner.

Valuable timber trees that are to remain, either within or outside the established clearing limits, that are subsequently damaged by the contractor and are beyond saving, shall immediately be removed and replaced with well started nursery grown trees of the same or appropriate species. Areas of ground cover destroyed by the contractor's equipment or operations will be reseeded as nearly as possible to original conditions at the contractor's expense.

### C. STORAGE AND HOUSING

The location of the contractor's storage and service facilities, required temporarily in the performance of the work, shall be upon cleared portions of the job site or areas to be cleared. The preservation of the landscape shall be an imperative consideration in the selection of all such sites.

### D. TEMPORARY EXCAVATION AND EMBANKMENTS

If the contractor proposes to construct temporary roads or embankments and excavations for plant and/or work areas, he shall obtain approval of the desired action from the permit agency prior to the start of the work.

### E. POST-CONSTRUCTION CLEANUP OR OBLITERATION

The contractor shall remove all signs of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stock-piles of excess or waste materials, or any other vestiges of construction operations upon completion of the project. It is anticipated that excavation, filling and plowing of roadways will be required to restore the area to near natural conditions which will permit the growth of vegetation thereon. The disturbed areas shall be graded and filled as required, and soil sufficient to establish rough ground cover shall be spread to a depth of approximately 6 inches over the entire area, and the entire area subsequently seeded. Restoration of original contours is not required.

## II. PROTECTION OF WATER RESOURCES

Persons conducting stream clearance shall not pollute streams, lakes or reservoirs with fuels, oils, bitumens, calcium chloride, acids or harmful materials. All work under permit shall be performed in such a manner that objectionable conditions will not be created in streams through or adjacent to the contract areas.

A. SPILLAGES

Measures shall be taken to prevent chemicals, fuels, oils, greases, bituminous materials, waste washings, and cement drainage from entering public waters.

B. DISPOSAL

Disposal of any materials, wastes, effluents, trash, garbage, oil, grease, chemicals, etc., in areas adjacent to streams shall be subject to the approval of the permit agency representative for reasons similar to those stated above.

If any waste material is dumped in unauthorized areas the contractor shall remove the material and restore the area to the condition of the adjacent undisturbed area. If necessary, contaminated ground shall be excavated, disposed of as directed by the agency representative, and replaced with suitable fill material, compacted and finished with topsoil all at the expense of the contractor.

C. EROSION CONTROL

The contractor will observe construction practices designed to minimize erosion and sedimentation as a result of necessary instream or bank work. Stream crossings will be kept to a minimum as well as the operation of equipment in the stream. To the extent possible, equipment such as drag lines, grade-alls, or back hoes that may operate from the stream bank should be used. Where the use of such equipment from the stream bank requires an undue amount of clearing, other types of equipment such as a rubber tired front-end loader may be used in the stream. Equipment such as a bulldozer should only be used where clearance and restoration work cannot be established within the limits of practicality by other equipment. All disturbed areas above the normal water line will be protected from erosion within 20 days by mulching, seeding, planting or mechanical means.

Decisions relative to type of equipment to be used may be made on site by the agency authorizing the work.

D. PROTECTION OF FISH AND WILDLIFE

The contractor shall at all times perform all work and

take such steps required to prevent destruction of fish and wildlife. The contractor will not be permitted to alter water flows or otherwise disturb native habitat adjacent to the contract area which are critical to fish or wildlife. Fouling or pollution of water will not be permitted.

Rooted trees and shrubs on stream banks will not be removed except where necessary for access to the stream. Number and location of access points will be approved in the permit.

Access roads and stream crossings to be built by the contractor will be kept to a minimum and should avoid wetlands and other special areas of fish or wildlife habitat designated by the appropriate State agency.

Stream clearing will include only the removal of up-rooted trees and vegetation and foreign debris. Rooted vegetation will remain except in isolated instances where precariously situated trees pose a danger to life or property, or where downstream flooding is a threat if such objects are not removed from the stream.

Minor vegetative debris in the stream and on banks will remain in those cases where removal of such material would be destructive to stream banks and vegetative cover.

Eroded stream banks will be regraded to their original character and seeded with approved seeding mixtures. This action will be undertaken only when there is reasonable certainty for a stable repair.

During the course of work the stream bed gradient will not be reshaped to a uniform gradient, thereby eliminating the natural pool-riffle relationship. Care must be exercised not to create "sheeting" or extensive shallow water conditions which extend the full width of the stream channel.

Where scouring or other actions caused by flooding have caused the above conditions in the stream, the re-establishment of pool-riffle conditions and a low flow channel can be achieved through proper placement of low deflectors and/or large boulders. Such action should be taken only on approval of the permit issuing agency or its field representative to assure the action will not re-establish the flood hazard or have some other unfavorable impact.

Stream bottom replacement material, if needed, should consist of boulders, rubble and coarse gravel. The use of sand and fine gravel as replacement material should be avoided.



Debris spoil piles shall be located so that the debris will not re-enter the water during high stream flow.

E. BURNING

General restrictions applicable to stream clearance and restoration projects are as follows:

- (1) Material not specified to be disposed of in other manners may be burned within the contract area and at any time within the contract period, as specified by local regulations or waivers, stipulated in the permit, provided such burning does not create a fire or significant air pollution hazard.
- (2) The specific time, location and manner of burning shall be subject to the approval of the permit agency representative from the viewpoints of air pollution, governing fire and air pollution laws and safety.
- (3) In the interest of conservation, the contractor may, should he desire to do so, make available to the general public without charge, the material scheduled for burning.
- (4) No burning operations shall be conducted within 100 feet of any standing timber or other flammable growth. Burning shall be accomplished in such a way as to protect vegetation which is to remain.
- (5) All burning shall be sufficiently thorough that the materials will be reduced to ashes.
- (6) Charred material will be buried after it is determined that it can not be disposed of by methods used in the normal burning operation. All material disposed of in such manner shall be buried at locations approved in the permit.
- (7) Fires shall be guarded at all times and shall be under constant surveillance until they have been extinguished.
- (8) The contractor shall furnish at the site adequate fire fighting equipment to properly equip his personnel for fighting fires.

The contractor will be responsible for any damage to

life and/or property resulting from fires that are started by his employes or as a result of his operations.

#### MAINTENANCE OF POLLUTION CONTROL FACILITIES DURING CONSTRUCTION

During the construction period the contractor will conduct frequent inspections and provide environmental protection guidance to his personnel. This guidance should include methods of preventing pollution, restoring natural ecological conditions, and installation of vegetation cover, fish and wildlife measures, and facilities to prevent and correct environmental degradation to water and aesthetic qualities. The contractor shall remain responsible throughout the period of the contract for providing all necessary personnel and equipment and the conduct of various actions as necessary to prevent environmental damages and to protect fish and wildlife as they may be involved in the project area.

#### COORDINATION AND REGULATION

Stream clearance and restoration projects are mainly of local significance. All such projects should be conducted under a State permit that meets or exceeds these guidelines in terms of protection of the environmental quality of the area under consideration. The permit requirements should be established by the signatory State in which the project is located. Where such permit or specific system for the control of stream clearance and restoration projects is not provided by the signatory State, the Susquehanna River Basin Commission will, in the basin, assume such jurisdiction under provisions of its Compact, and in direct cooperation with appropriate agencies of the signatory State, require adherence to these guidelines. Exceptions will be work performed under imminent flood threat and during the period when a declared state of emergency exists following a major flood disaster.

Normally application for all stream clearance and restoration work, unless otherwise excepted, shall be made directly to the State agency responsible for control of stream encroachment. The lead State agency, or the Commission where applicable, will advise the Fish, Game and other interested State agencies and the conservation district of the application and request their comment and cooperation in the inspection and control of such projects. Approved applications returned to the applicant should require a return receipt form indicating the appli-

cant is fully aware of all conditions of the permit or other form of authorization and agrees to comply with all stated requirements and those imposed by an appropriate State representative after on-site inspection during the conduct of the work. Key agencies should be kept apprised of all approved permits. The investigation and inspection system should be established and funded as a part of the overall project cost to the funding agency or interest.

For work to be conducted under emergency conditions immediately after a flood disaster, appropriate State agencies should establish an emergency procedure for prompt authorization and regulation of emergency stream clearance work. Field teams on a regional and local (county) basis should be designated, trained and authorized to act in the field to approve and set conditions for emergency clearance projects to the extent necessary to alleviate flood hazard situations and insure protection of the environment in the project area.

AGENCIES WHICH PARTICIPATED  
IN THE DEVELOPMENT OF  
THE STREAM CLEARANCE GUIDELINES

Baltimore District Corps of Engineers

Joint Legislative Air and Water Pollution Control and Conservation Committee of the Pennsylvania Legislature

Md. Department of Natural Resources

Md. Fish Administration, Department of Natural Resources

N.Y. Department of Environmental Conservation

Office of Emergency Preparedness

Pa. Department of Environmental Resources

Pa. Fish Commission

Pa. Game Commission

Soil Conservation Service, Harrisburg, Pa.

Soil Conservation Service, Syracuse, N.Y.

















